EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for the fourth quarter of 2004 -- comparing the performance against the requirements from BAH, including Terra, TRMM, and QuikScat, Aqua, ADEOS II, Aura, SAGE III, and ICESat requirements

Up to date graphical results can be found on the NEW EOS network performance web site (now pretty stable): http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the individual site links below.

Highlights:

- Mostly stable performance.
- Problems fixed at NSSTC and Ohio State
- Dedicated T1 from GSFC to Toronto removed – now routed via CA*net4 peering in Chicago
- Considerable congestion observed on all tests from GSFC-ICESAT -- not observed to the same destinations from GSFC-MAX
- Abilene has changed their policy to allow NISN sources to transit Abilene to get to international peers (on a case by case basis). This could be very useful for EOS, e.g., LaRC → UCL (London)
- The May '04 requirements are now used as the basis for the ratings; ADEOS 2 requirements have been removed.

Ratings:

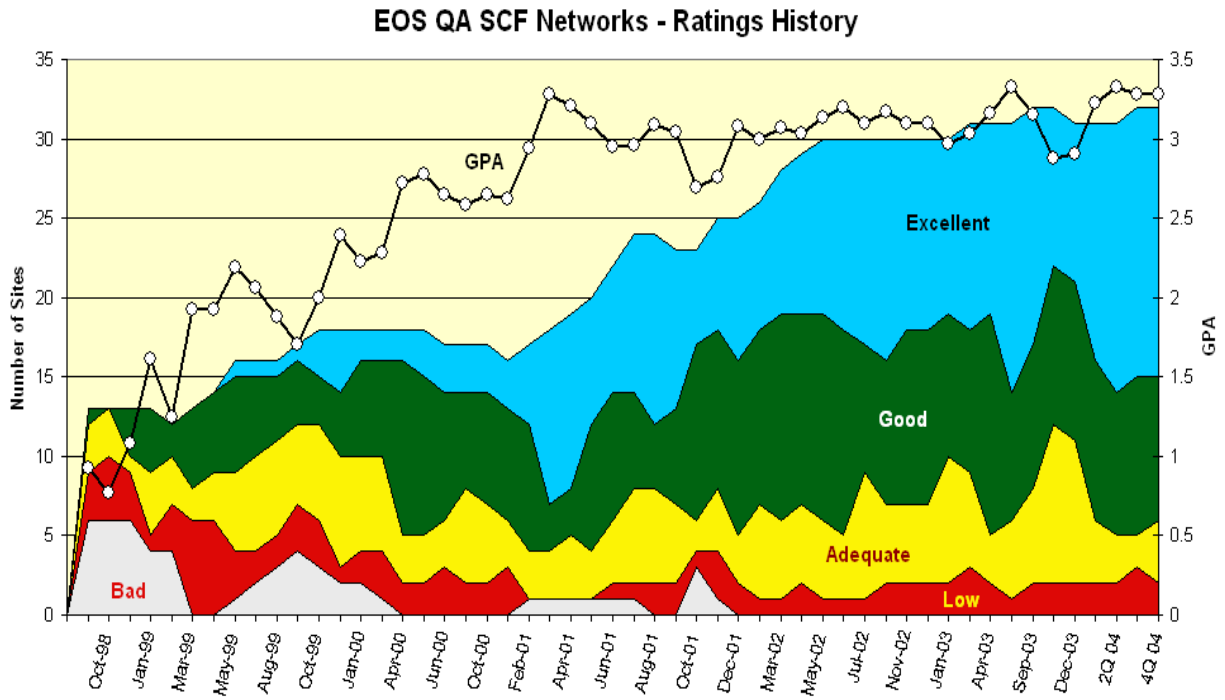
Rating Categories:

Excellent: median of daily worst cases > 3 x requirement
Good: median of daily worst cases > requirement

Adequate: median of daily worst cases < requirement
and
median of daily medians > requirement

Low: median of daily medians < requirement.
Bad: median of daily medians < 1/3 of the requirement.

The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



Ratings Changes:

Upgrades: ↑

LaTIS → NSSTC: Low → **Good**
GSFC-ICESAT → Ohio State: Low → **Good**
LDAAC → Toronto: Good → **Excellent**

Downgrades: ↓

JPL → RSS: Adequate → **Low**
LaTIS → Colo State: Good → **Adequate**
GSFC-ICESAT → MIT: Good → **Adequate**
GSFC-ICESAT → Washington: Good → **Adequate**
LDAAC → UCL: Excellent → **Good**

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EOS QA SCF Sites: Network Requirements vs. Measured Performance

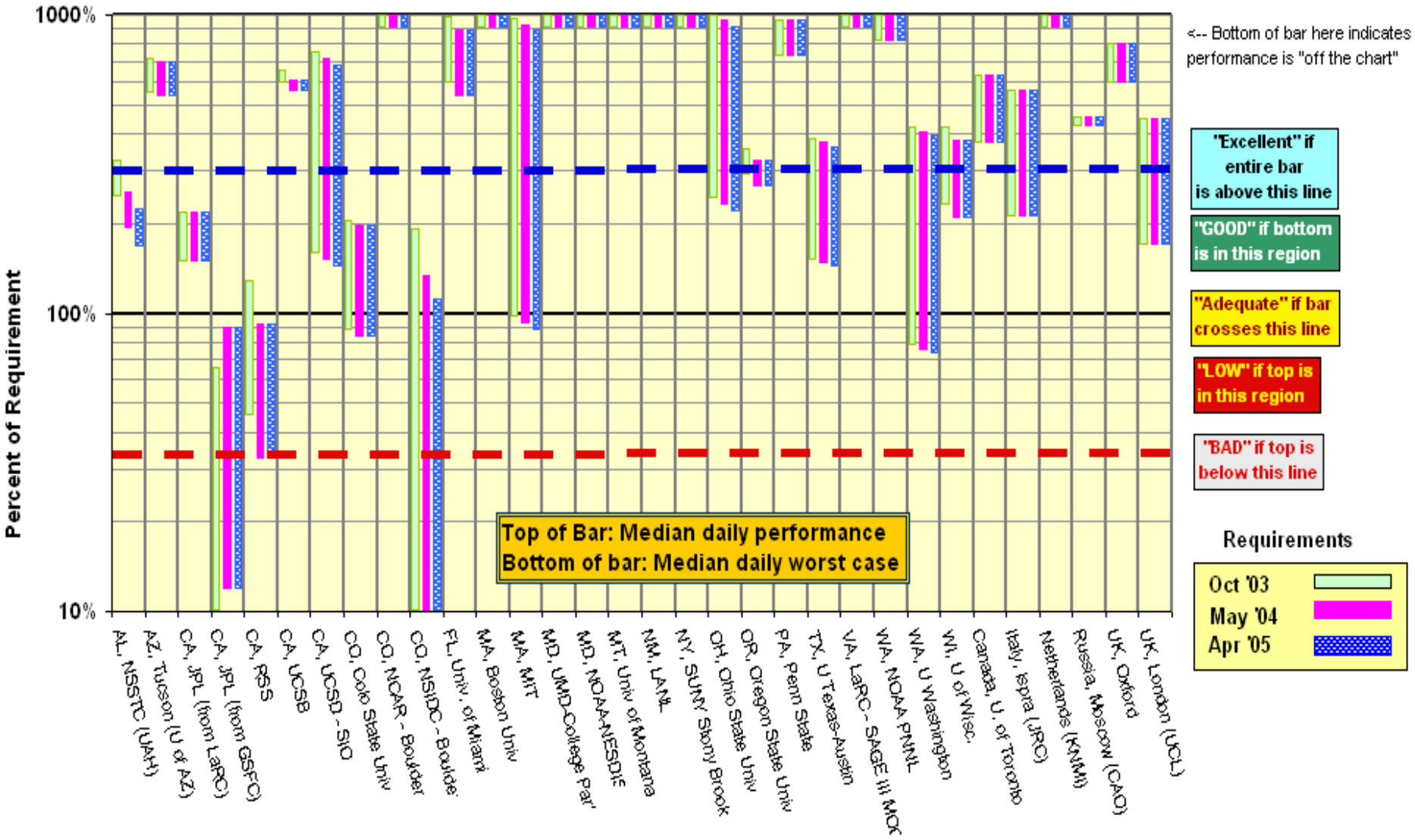
4 Q 2004		Requirements (kbps)			Testing						
Destination	Team (s)	Previous: Oct-03	Current: May-04	Future: Apr-05	Source Node	Media n kbps	Median Daily Worst	Rating re Current Requirements May-04	Prev	Rating re Apr-05	Route Tested
AL, NSSTC (UAH)	CERES, AMSR-E	4878	6236	7127	LaTIS	15971	11922	GOOD	L	GOOD	NISN + FDDI
AZ, Tucson (U of AZ)	MODIS, ~~MISR~~	2750	2811	2811	EDC	19585	15016	Excellent	E	Excellent	Abilene via vBNS+ / DC
CA, JPL (from LaRC)	MISR	18484	18484	18483	LDAAC	40452	27505	GOOD	G	GOOD	EMSnet
CA, JPL (from GSFC)	AIRS, TES, others	24798	18088	18088	GDAAC	16211	2148	LOW	L	LOW	NISN SIP
CA, RSS	AMSR-E	1926	2696	2696	JPL-PODAAC	2488	871	LOW	A	LOW	2 * T1 - Consolidated
CA, UCSB	MODIS	2903	3126	3126	GDAAC	18956	17191	Excellent	E	Excellent	Abilene via MAX
CA, UCSD - SIO	ICESAT, CERES	6478	6792	7107	GSFC-ICESAT	48468	10176	GOOD	G	GOOD	Abilene via NISN / MAX
CO, Colo State Univ	CERES	2049	2147	2147	LaTIS	4207	1787	Adequate	G	Adequate	NISN -> Abilene via Chicago
CO, NCAR - Boulder	MOPITT, HIRDLS	3121	3121	3121	LDAAC	19071	17366	Excellent	E	Excellent	NISN -> Abilene via Chicago
CO, NSIDC - Boulder	AMSR	4373	6248	7497	NSSTC	8358	283	Adequate	A	Adequate	NISN SIP
FL, Univ. of Miami	MODIS, MISR	16991	18823	18823	GDAAC	167238	99753	Excellent	E	Excellent	Abilene via MAX
IL, UIUC	MISR	1133	1133	1133	Testing started March '05						
MA, Boston Univ	MODIS, MISR	2781	3035	3035	EDC DAAC	64753	43239	Excellent	E	Excellent	Abilene via vBNS+ / DC
MA, MIT	ICESAT	6378	6692	7007	GSFC-ICESAT	62141	6142	Adequate	G	Adequate	Abilene via NISN / MAX
MD, UMD-College Park	MODIS	2025	2039	2039	GSFC-MAX	73948	55982	Excellent	E	Excellent	Direct Fiber
MD, NOAA-NESDIS	CERES, AMSR-E	1513	1517	1517	NSIDC	25931	20202	Excellent	E	Excellent	Abilene via FRGP, MAX
MT, Univ of Montana	MODIS	747	819	819	EDC DAAC	17655	11139	Excellent	E	Excellent	Abilene via vBNS+ / DC
NM, LANL	MISR	1033	1033	1033	LaRC DAAC	16150	14005	Excellent	E	Excellent	NISN -> ESNet via CA
NY, SUNY Stony Brook	CERES	566	573	573	LaTIS	25383	13302	Excellent	E	Excellent	NISN -> Abilene via Chicago
OH, Ohio State Univ	ICESAT	5678	5992	6307	GSFC-ICESAT	57880	13774	GOOD	L	GOOD	Abilene via NISN / MAX
OR, Oregon State Univ	CERES, MODIS	6929	7570	7570	LaTIS	24551	19969	GOOD	G	GOOD	NISN -> Abilene via Chicago
PA, Penn State	MISR	2642	2642	2642	LaRC DAAC	25407	19145	Excellent	E	Excellent	NISN -> Abilene via Chicago
TX, U Texas-Austin	ICESAT	10430	10745	11060	GSFC-ICESAT	40057	15714	GOOD	G	GOOD	Abilene via NISN / MAX
VA, LaRC - SAGE III MOC	SAGE III	200	200	200	GSFC-CSAFS	6592	4047	Excellent	E	Excellent	NISN SIP
WA, NOAA PNNL	MISR	1442	1442	1442	LaRC DAAC	15426	11713	Excellent	E	Excellent	NISN -> ESNet via Chicago
WA, U Washington	ICESAT	11003	11374	11746	GSFC-ICESAT	46333	8538	Adequate	G	Adequate	Abilene via NISN / MAX
WI, U of Wisc.	MODIS, CERES, AIRS	14788	16461	16461	GDAAC	62671	34044	GOOD	G	GOOD	Abilene via MAX
Canada, U. of Toronto	MOPITT	612	612	612	LaRC DAAC	3833	2275	Excellent	G	Excellent	NISN-CA*net4
Italy, Ispra (JRC)	MISR	517	517	517	LaRC DAAC	2891	1080	GOOD	G	GOOD	NISN-UUNET-Milan
Netherlands (KNMI)	OMI	1024	1024	1024	GSFC-MAX	32575	27312	Excellent	E	Excellent	Abilene --> NY -> Surfnet
Russia, Moscow (CAO)	SAGE III	26	26	26	CAO-->LaRC-N	119	110	Excellent	E	Excellent	NISN -> Moscow
UK, Oxford	HIRDLS	512	512	512	GSFC-MAX	4115	3016	Excellent	E	Excellent	Abilene->Geant (NY) -> JAnet
UK, London (UCL)	MISR, MODIS	1033	1033	1033	LaRC DAAC	4626	1744	GOOD	E	GOOD	NISN / Level3 (San Jose)

*Rating Criteria:	
Excellent	Median of Daily worst hours >= 3 *Requirement
GOOD	Median of Daily worst hours >= Requirement
Adequate	Median of Daily worst hours < Requirement <= Median of Daily Medians
LOW	Requirement > Median of Daily Medians
BAD	Requirement > 3 * Median of Daily Medians

Rating	Current May-04	Last Report	Future: Apr-05
Excellent	17	17	17
GOOD	9	10	9
Adequate	4	2	4
LOW	2	3	2
BAD	0	0	0
Total	32	32	32
GPA	3.28	3.28	3.28

EOS QA SCF Sites

Daily Median and Worst Performance as a percent of Requirements



Details on individual sites:

Each site listed below is the DESTINATION for all the results reported in that section. The first test listed is the one on which the rating is based -- it is from the source most relevant to the driving requirement. Other tests are also listed. The three values listed are derived from [nominally] 24 tests per day. For each day, a daily best, worst, and median is obtained. The values shown below are the medians of those values over the test period.

1) AL, NSSTC (UAH) (aka GHCC)

Rating: ↑ Low → **Good**
Teams: CERES, AMSR
Domain: nsstc.uah.edu
Web Page:http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC LaTIS	16.1	16.0	11.9	NISN SIP
GSFC	20.6	20.2	14.0	NISN SIP
NSIDC	5.4	5.3	2.1	NISN SIP
NSSTC → NSIDC	8.5	8.4	0.3	NISN SIP

Requirements:

Source Node	Date	Mbps	Rating
LaRC LaTIS	Oct '03	4.9	Good
LaRC LaTIS	May '04	6.2	Good
LaRC LaTIS	Apr '05	7.1	Good

Comments: Thruput from LaTIS improved to the levels above in late October, improving the rating to "Good". Thruput from GSFC has been mostly stable since April '03. Thruput between NSSTC and NSIDC remains limited by the NISN PVC at NSIDC and congestion.

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2) AZ, Tucson (U of AZ):

Rating: Continued **Excellent**
Teams: MODIS
Domain: arizona.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/ARIZONA.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC LPDAAC	27.0	19.6	15.0	Abilene via vBNS+ / DC
GSFC	32.2	28.6	23.9	Abilene via MAX
LaRC DAAC	26.2	25.5	20.3	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
EDC LPDAAC	'03 - '05	2.8	Excellent

Comments: The ratings are based on the MODIS flow from EDC (There is no longer a requirement from LaRC, as the MISR team has all moved away from Arizona).

Performance was stable from LDAAC, and somewhat from EDC and GSFC in September and remained at the improved levels above, keeping the rating "Excellent".

3) CA, JPL:

Ratings: GSFC: Continued **Low**
LaRC: Continued **Good**

Teams: MISR, AIRS, TES, MLS, ASTER
Domain: jpl.nasa.gov
Web Pages: http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC → MISR	40.7	40.5	27.5	EMSnet (iperf)
LaRC DAAC → MISR	19.5	19.4	13.7	EMSnet (ftp)
GSFC DAAC → AIRS	17.5	16.2	2.1	NISN SIP
GSFC → MISR	13.3	13.2	10.5	NISN PIP

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03 - '05	18.5	Good
GSFC DAAC	'04, 05	18.1	Low

Comments:. During this period, iperf thruput from LaRC to JPL-MISR was at the nominal circuit limit, rating "Good". FTP testing was limited by window size, and got about half the thruput (multiple streams were used with iperf). The network has been stable since July '03.

Testing to AIRS is from GDAAC, and uses SIP. Thruput from GDAAC to JPL-AIRS has been generally steady since September '02. The daily median is slightly below the requirement, thus a FY'03-'05 rating of "LOW". The low value for the daily worst indicates that there is considerable congestion in this path.

Testing from the GSFC campus to JPL has been routed via NISN PIP since September '02, with very steady performance.

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4) CA, RSS: (Santa Rosa):

Ratings: ↓ Adequate → **Low**

Teams: AMSR
Domain: remss.com
Web page: http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml

Test Results:

Source Node	Medians of daily tests (Mbps)			Route
	Best	Median	Worst	
JPL PODAAC	2.84	2.49	0.87	NISN SIP: 2 x T1
GSFC	2.51	2.18	0.64	NISN SIP: 2 x T1

Requirements:

Source Node	FY	Mbps	Rating
JPL PODAAC	'04 – '05	2.70	Low

Comments: Thruput has been quite stable since August '02, about as good as can be expected from a pair of T1s. However, there was more variation this month, probably as a result of increased user flow, and the median thruput from JPL dropped a bit below the requirement, reducing the rating to "Low"..

Note: RSS also has a requirement to flow data to NSSTC (see #1); it is not tested. The requirement is 900 kbps in FY '03, but grows to 3.1 mbps in FY'04 and 4.4 mbps in FY'05. While the FY'03 requirement is achievable with the 2 x T1 configuration, the FY'03 and '04 flows are not.

5) CA, UCSB:

Ratings: GSFC: Continued **Excellent**
EDC: Continued **Excellent**

Teams: MODIS
Domain: ucsb.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DAAC	20.5	19.0	17.2	Abilene via NISN / MAX
EDC-LPDAAC	20.0	16.8	15.1	Abilene via vBNS+ / DC

Requirements:

Source Node	FY	mbps	Rating
GSFC-DAAC	'04, '05	3.1	**Excellent**
EDC-LPDAAC	'04, '05	2.2	**Excellent**

Comments: The requirements are split between EDC and GSFC. Performance from both GSFC and EDC is very steady. The rating remains "Excellent" from both sites.

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6) CA, UCSD (SIO):

Ratings: ICESAT: Continued **Good**
LaTIS: Continued **Excellent**

Teams: CERES, ICESAT
Domain: ucsd.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCSD.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	75.8	48.5	10.2	Abilene via NISN / MAX
LaTIS	26.2	25.1	20.2	Abilene via NISN / Chi
GSFC-PTH	62.5	57.4	26.0	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'05	7.0	**Good**
LaTIS	'02 - '05	0.26	**Excellent**

Comments: The rating is based on testing from the ICESAT SCF at GSFC. The daily worst from ICESAT remained a bit below 3 x the requirement, keeping the rating "Good". The difference in the daily worst value between the performance from ICESAT and GSFC-PTH shows that there is considerable congestion from ICESAT (also observed to other ICESAT sites).

Performance from LaTIS has been stable since April '03. The CERES requirements are much lower than ICESAT, so the LaTIS rating continues as "Excellent".

7) CO, Colo State Univ.:

Rating: ↓ Good → **Adequate**

Teams: CERES
Domain: colostate.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/COLO_ST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	4.40	4.21	1.79	Abilene via NISN / Chicago
GSFC	7.13	7.08	6.59	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'04, '05	2.05	**Adequate**

Comments: Performance from both LaTIS and GSFC has been stable since December '03. The daily median from LaTIS was stable, but the daily worst dropped below requirement for '04 through '05, indicating congestion on the NISN-Chicago link. So the rating drops to "Adequate". Performance from GSFC would rate as "Excellent".

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8) CO, NCAR:

Ratings: GSFC: Continued **Excellent**
LaRC: **Excellent**

Teams: MOPITT, HIRDLS
Domain: scd.ucar.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	19.4	19.1	17.4	Abilene via NISN / Chicago
GSFC-MAX	89.7	89.3	57.0	Abilene via MAX
EDC	71.8	42.1	28.9	Abilene via vBNS+ / Chicago

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03 - '05	2.4	**Excellent**
GSFC	'04, '05	3.1	**Excellent**

Comments: Testing from LaRC resumed in early October, so the rating is again based on both GSFC and LDAAC. Performance from LDAAC was steady at 20 mbps, and rates "Excellent"

Performance from GSFC to the new NCAR host dropped in early October (peaks had been 170 mbps previously). The flow began exhibiting "slow TCP rampup" at that time, a condition in which it may take over 5 minutes for TCP to achieve a rate close to the circuit limit. It is now believed that this problem is due to a Gig-E source and a fast WAN, connecting via a switch to a Fast-E destination. The burstiness of TCP can send packets to the bottleneck switch faster than they can be sent out the 100 mbps Ethernet interface, thus causing packet loss, and degraded TCP performance. Nevertheless, the median daily worst remains far above 3 x the requirement, so the ratings remain "Excellent"".

9) FL, Univ. of Miami:

Rating: GSFC: Continued **Excellent**
LaRC: Continued **Excellent**

Teams: MODIS, MISR
Domain: rsmas.miami.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/MIAMI.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DAAC	193.8	167.2	99.8	Abilene via MAX
GSFC-MAX	223.0	179.1	122.3	Abilene via MAX
LaRC DAAC	26.5	25.7	19.3	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04 - '05	18.8	**Excellent**
LaRC DAAC	'04 - '05	1.1	**Excellent**

Comments: Thruput from GDAAC has been stable since the GDAAC firewall upgrade in late November '03. The rating remains "Excellent".

Performance from LaRC DAAC has been stable since May '03, also rating "Excellent".

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10) MA, Boston Univ:

Ratings: EDC: Continued **Excellent**
LaRC: Continued **Excellent**

Domain: bu.edu
Teams: MODIS, MISR
Web Page: http://ensight.eos.nasa.gov/Missions/terra/BU.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC DAAC	76.0	64.8	43.2	Abilene via vBNS+ / DC
GSFC	90.5	85.2	61.6	Abilene via MAX
LaRC DAAC	26.2	20.4	12.6	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
EDC DAAC	'04 - '05	3.0	**Excellent**
LaRC DAAC	'04 - '05	1.2	**Excellent**

Comments: Performance from all sources remained stable. The rating remains "Excellent".

11) MA, MIT:

Rating: ↓ Good → **Adequate**

Teams: ICESAT
Domain: mit.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/MIT.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	75.8	62.1	6.1	Abilene via NISN / MAX
GSFC-MAX	90.0	84.2	69.7	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04, '05	6.7, 7.0	**Adequate**

Comments: Median performance from GSFC ICESAT to MIT is subject to additional congestion inside GSFC, with the daily worst now a bit below the requirement, further dropping the rating to "Adequate". From GSFC-MAX there is much less congestion apparent; performance has been stable -- the rating would remain "Excellent".

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12) MD, NOAA-NESDIS (Camp Springs)

Rating: Continued **Excellent**

Teams: CERES, AMSR-E
Domain: nesdis.noaa.gov
Web Pages: http://ensight.eos.nasa.gov/Missions/terra/NOAA_Camp_Springs.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
NSIDC	26.1	25.9	20.2	FRGP / Abilene / MAX
LaTIS	16.5	12.6	5.2	
GSFC-MODIS	32.9	32.8	32.2	Peering at MAX

Requirements (QA only):

Source Node	FY	mbps	Rating
NSIDC	'02 – '05	1.52	**Excellent**
LaTIS	'02 – '05	0.21	**Excellent**

Comments: The performance from all sources has been stable since it improved around mid August '04, due to upgrades at NOAA. The rating remains "Excellent" from both NSIDC and LaTIS..

13) MD, Univ. of Maryland:

Rating: Continued **Excellent**

Teams: MODIS
Domain: umd.edu
Web Pages: http://ensight.eos.nasa.gov/Missions/terra/UMD_SCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MAX	74.7	73.9	56.0	Direct Fiber OC-12 / MAX / SCF
EDC	68.1	53.0	34.5	VBNS+ / Abilene / MAX / SCF
NSIDC	37.6	32.7	28.4	Abilene / MAX / SCF

Requirements (QA only):

Source Node	FY	mbps	Rating
GSFC DAAC	'02 – '05	2.0	**Excellent**

Comments: The 4th quarter of '04 was characterized by 3 stable periods: From July to October, thruput was about 200 mbps from GSFC-MAX, 120 mbps from EDC, and 90 mbps from NSIDC. During most of November, thruput from these three sources was only about 9 mbps. After that, the performance went to the levels shown above. Due to the modest requirement, all of these performance levels rate as "Excellent"

Note: this test node has gone down in January, and no testing will be performed until a replacement node is found.

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14) MT, Univ of Montana:

Rating: Continued **Excellent**

Teams: MODIS
Domain: ntsg.umt.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/MONT.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC LPDAAC	18.8	17.7	11.1	VBNS+ / DC / Abilene
GSFC	38.4	30.6	19.5	MAX / Abilene
NSIDC	39.8	31.7	19.3	CU / FRG / Abilene

Requirements:

Source Node	FY	mbps	Rating
EDC LPDAAC	'04 - '05	0.82	**Excellent**

Comments:. Stable performance from all sources. With the low requirements, the rating continues as "Excellent".

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15) NM, LANL:

Rating: Continued **Excellent**

Teams: MISR
Domain: lanl.gov
Web Page: http://ensight.eos.nasa.gov/Missions/terra/LANL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	16.2	16.2	14.0	NISN SIP / MAE-W (Ames) / ESnet
GSFC	16.7	16.6	16.4	MAX / ESnet

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'05	1.03	**Excellent**

Comments: Performance from both LDAAC and GDAAC was stable since the ESnet upgrade in early July. The rating remains "Excellent"

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16) NY, SUNY-SB:

Rating: Continued **Excellent**

Teams: CERES, MODIS
Domain: sunysb.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/SUNYSB.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	26.9	25.4	13.3	NISN SIP / Chicago / Abilene / NYSERnet
GSFC	72.9	60.3	37.5	MAX / Abilene / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'02-'05	0.57	**Excellent**

Comments: Performance from LaTIS has been generally stable since October '03. Higher, but noisy performance from GSFC. With the low requirement, the rating remains "Excellent".

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17) OH, Ohio State Univ:

Rating: ↑ **Low** → **Good**

Teams: ICESAT
Domain: ohio-state.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/OHIO_STATE.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	73.7	57.9	13.8	Abilene via NISN / MAX
GSFC-MAX	59.8	52.8	41.6	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04, '05	6.0, 6.3	**Good**

Comments: Performance problems at Ohio State were fixed on Sept 20, and thruput recovered to previous values. Due to congestion at ICESAT, the daily worst from ICESAT is less than 3 x the requirement, so the rating is "Good". Without this congestion, the daily worst from GSFC-MAX is much higher; the rating would be "Excellent"

18) OR, Oregon State Univ:

Ratings: LaTIS: Continued **Good**
GSFC: Continued **Excellent**

Domain: oce.orst.edu
Teams: CERES, MODIS
Web Page:http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	26.0	24.6	20.0	Abilene via NISN / Chicago
JPL	64.2	57.3	25.8	Abilene via CalRen
GSFC	52.8	35.8	17.1	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'04 - '05	7.5	Good
GDAAC	'02 - '05	0.25	Excellent

Comments: Performance from all sources stable (but noisier than expected from nearby JPL); the rating from LDAAC remains "Good" (close to "Excellent").

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19) PA: Penn State Univ:

Rating: Continued **Excellent**
Teams:MISR
Domain: psu.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	26.5	25.4	19.1	Abilene via NISN / Chicago
GSFC	159.2	157.7	137.0	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'05	2.6	Excellent

Comments: Performance from LDAAC was very stable; the rating remains "Excellent". Performance from GSFC improved to the above levels in September (Median was 70 mbps previously)

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20) TX: Univ. Texas - Austin

Rating: Continued **Good**
Teams: ICESAT
Domain: utexas.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	43.2	40.1	15.7	Abilene via NISN / MAX
GSFC-MAX	44.4	44.2	37.7	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03, 05	10.7, 11.1	Good

Comments: Performance from GSFC-MAX and ICESAT-SCF at GSFC via Abilene has been very stable since July '03; with congestion indicated at ICESAT. The rating remains "Good" (would be "Excellent" from GSFC-MAX).

21) VA, LaRC: SAGE III MOC:

Rating: Continued **Excellent**

Teams: SAGE III
Domain: larc.nasa.gov
Web Page: http://ensight.eos.nasa.gov/Missions/sage/SAGE_MOC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-SAFS	7.0	6.6	4.0	NISN PIP

Requirements:

Source Node	FY	mbps	Rating
GSFC SAFS	'02 – '05	0.20	**Excellent**

Comments: Stable thruput since upgrade of LaRC MOC machine in Feb '03. Rating continues "Excellent"

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22) WA, Pacific Northwest National Lab:

Rating: Continued **Excellent**

Teams: MISR
Domain: pnl.gov
Web Page: http://ensight.eos.nasa.gov/Missions/terra/PNNL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	15.7	15.4	11.7	ESnet via NISN – Ames
GSFC	19.3	19.2	18.9	ESnet via MAX

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'05	1.4	**Excellent**

Comments: Performance from LaRC to PNNL has been stable; the rating remains "Excellent". Thruput has been extremely stable from GSFC. This test node has gone down in mid November and has not recovered; testing will not resume until the test node is restored.

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23) WA, Univ Washington:

Rating: ↓ Good → **Adequate**

Teams: ICESAT
Domain: washington.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/UW.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	68.3	46.3	8.5	Abilene via NISN/MAX
GSFC-MAX	61.4	55.8	45.2	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04, '05	11.3, 11.7	**Adequate**

Comments: Performance from ICESAT-SCF at GSFC is much noisier than from GSFC-MAX (as with all ICESAT sites). The median daily worst from ICESAT dropped below the requirement; reducing the rating to "Adequate" – but would be "Excellent" from GSFC-MAX.

24) WI, Univ. of Wisconsin:

Ratings: GSFC: Continued **Good**
LARC: Continued **Adequate**

Teams: MODIS, CERES, AIRS
Domain: ssec.wisc.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/WISC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
G-DAAC	78.6	62.7	34.0	MAX / Abilene / Chi / MREN
LaTIS	16.0	12.5	6.3	NISN / Chicago / MREN

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04 - '05	16.5	Good
LaRC Combined	'03, '04	6.8, 7.5	Adequate

Comments: Performance from both sites was noisy but stable; the rating from GSFC remains "Good" and from LaRC remains "adequate".

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25) Canada, Univ of Toronto:

Rating: ↑ Good → **Excellent**

Team: MOPITT
Domain: physics.utoronto.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC→ IST	5.6	3.8	2.3	NISN / Chicago / CA*net4
LaRC DAAC → Test Node	17.6	16.3	9.5	NISN / Chicago / CA*net4
GSFC → IST	6.8	6.2	4.1	NISN / Chicago / CA*net4
GSFC→ Test Node	44.1	43.0	39.1	MAX / Abilene / Chicago / CA*net4

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 - '05	100	Excellent
GSFC EOC	'02 - '05	512	Excellent
Combined	'02 - '05	612	Excellent

Comments: Flows to the Toronto IST node were switched from the dedicated NISN T1 to CA*net4 in late October. Performance from both LDAAC (Source of QA data) and GSFC (Source for IST) to the IST at Toronto improved (was about 1.4 mbps via the private T1), but is considerably lower than to the test node, also on campus. This improved performance increases the rating to "Excellent".

26) Italy, EC - JRC:

Rating: Continued **Good**

Teams: MISR
Domain: ceo.sai.jrc.it
Web Page: http://ensight.eos.nasa.gov/Missions/terra/JRC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	3.43	3.14	1.34	NISN / UUnet / Milan
GSFC-NISN	3.12	2.89	1.08	NISN / UUnet / Milan

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 – '05	517	**Good**

Comments: Performance noisy but stable from both sources since July '03; the rating remains "Good".

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27) Netherlands, KNMI:

Rating: Continued **Excellent**

Teams: OMI
Domain: nadc.nl
Web Pages: http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml
http://ensight.eos.nasa.gov/Missions/aura/KNMI.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MAX → OMI PDR Server	23.6	23.3	15.2	MAX / Abilene/ NY / Surfnet
GSFC-MAX → OMI Backup PDR Server	37.8	32.6	27.3	MAX / Abilene/ NY / Surfnet
GSFC-MAX → KNMI Test Node	92.2	92.1	92.0	MAX / Abilene/ NY / Surfnet
GSFC-NISN → KNMI Test Node	32.0	20.4	6.8	NISN / Chi (?) / GBLX / Surfnet

Requirements: (2 ISTs Only)

Source Node	FY	Mbps	Rating
GSFC	'04 – '05	1.02	**Excellent**

Comments: Performance via Abilene and Surfnet is very stable to both the OMI PDR servers and the KMNI Test node. This is exceptionally good performance for US to Europe!

However, the NISN route exhibits much lower performance and significant noisiness.

Note: Previously, Abilene policy prevented NISN from using the Abilene / Surfnet route. However, a recent policy change would allow this route – it would improve performance.

28) Russia, CAO (Moscow):

Rating: Continued **Excellent**

Teams: SAGE III
Domain: mipt.ru
Web Pages: http://ensight.eos.nasa.gov/Missions/sage/CAO.shtml
http://ensight.eos.nasa.gov/Missions/sage/LARC_SAGE.shtml

Test Results:

Source → Dest	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
CAO → LaRC	119	119	110	MIPT / TCnet / NISN SIP
CAO → LaRC	1129	1088	783	Commodity Internet
LaRC → CAO	148	148	128	NISN SIP / TCnet / MIPT
LaRC → CAO	2938	2849	1562	Commodity Internet

Requirements:

Source → Dest	FY	kbps	Rating
CAO → LaRC	'02 – '05	26	**Excellent**
LaRC → CAO	'02 – '05	26	**Excellent**

Comments: Performance testing running since November '02, with dual routes. Performance on the NISN dedicated circuit to Moscow, then TCnet (NASA Russian ISP) tunnel to CAO ISP (MIPT) is extremely steady in both directions, with a rating (based on the modest requirement) of "Excellent".

The dual route configuration also allows testing via the commodity internet route. Performance via the internet route is much better, but is also more variable, and also would rate "Excellent".

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29) UK, London: (UCL SCF)

Rating: ↓ Excellent → **Good**

Teams: MODIS, MISR
Domain: ucl.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	16.7	4.6	1.7	NISN / Level3 (San Jose) / London
GSFC MAX	49.3	49.2	45.0	MAX / Abilene / NY / GEANT / JAnet

Requirements

Source Node	FY	mbps	Rating
LaRC DAAC	'02 – '05	1.03	**Good**

Comments: The route from LDAAC is still via NISN / Level3 peering in San Jose (since approx January '04). Performance is very noisy on this route, as indicated by the almost 10:1 ratio between the daily best and worst. The decreased daily worst is now below 3 x the requirement, so the rating drops to "Good".

Note: This is another good opportunity to benefit from the recent Abilene policy change, allowing our NISN data to transit Abilene to international destinations.

Performance from GSFC remains very stable and much higher than via the NISN / Level3 route; it would be rated "Excellent".

30) UK, Oxford:

Rating: Continued **Excellent**

Teams: HIRDLS
Domain: ox.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	4.12	4.12	3.02	MAX / Abilene / NY / GEANT /JAnet

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 – '04	512	**Excellent**

Comments: Very steady performance continues since May '03, rating "Excellent" compared to the IST requirement.

Test Results to other EOS HIRDLS UK Sites (Requirements TBD):

Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC → RAL	33.1	23.7	11.9	MAX / Abilene / NY / GEANT /JAnet

Comments: Thruput to RAL remains noisy, but somewhat less so – the median and daily worst improved about 10% over the last period, but the daily worst almost doubled. Performance is quite good, with occasional step changes. .